

CLAIMS

What is claimed is:

- 1 1. A tool for measuring parameters, comprising:
2 a plate having a surface and a plurality of edges;
3 at least one fixed measurement structure integrated with an edge of the
4 plurality of edges of the plate, the at least one fixed measurement structure
5 including:
6 a recessed portion; and
7 at least one projection extending upward within the recessed
8 portion forming at least one fixed variation measurement structure.
- 1 2. The tool according to claim 1, wherein the at least one fixed variation
2 measurement structure is provided between a sidewall of the projection and an
3 opposing sidewall formed from the recessed portion.
- 1 3. The tool according to claim 1, wherein the at least one fixed variation
2 measurement structure includes a first measurement indicia measuring a
3 distance from an edge of the recessed portion to a farthest edge of the at least
4 one projection.
- 1 4. The tool according to claim 1, wherein the at least one projection is
2 offset from center within the recessed portion.
- 1 5. The tool according to claim 4, wherein the at least one fixed variation
2 measurement structure includes two measurement indicia, a first of the two
3 measurement indicia measuring a distance from a first edge of the recessed
4 portion to a farthest edge from the first edge of the at least one projection and
5 a second of the two measurement indicia measuring a distance from a second

6 edge of the recessed portion to a farthest edge from the second edge of the at
7 least one projection.

1 6. The tool according to claim 1, further comprising a downslope
2 measuring distance structure.

1 7. The tool according to claim 6, wherein the downslope measuring
2 distance structure includes a measurement indicia from an edge of the
3 recessed portion to a portion on the plate.

1 8. The tool according to claim 1, wherein the at least one projection is
2 positioned at least at one sidewall of the recessed portion.

1 9. The tool according to claim 8, wherein the at least one projection
2 forming the at least one variation measurement structure is two projections,
3 each positioned at sidewalls of the recessed portion.

1 10. The tool according to claim 8, wherein the at least one projection
2 forms a stepped portion at the one sidewall.

1 11. The tool according to claim 8, wherein the at least one projection
2 provides a narrow recess closer to a bottom portion of the recessed portion
3 with respect to a portion above the at least one projection within the recessed
4 portion.

1 12. The claim according to claim 8, wherein the at least one projection and
2 recessed portion measures maximum and minimum allowable material
3 thickness of a specific thickness of the material.

1 13. The tool according to claim 1, wherein the at least one projection is at
2 least two projections spaced apart from one another within the recessed

3 portion, wherein one of the two projections is formed at the sidewall of the
4 recessed portion and the at least two projections form two variation
5 measurement structures.

1 14. The tool according to claim 1, wherein the at least one projection is
2 four projections, wherein the four projections provide weld bead variation
3 measurements for all wall thicknesses and form at least two variation
4 measurement structures.

1 15. The tool according to claim 14, wherein:
2 a first projection of the four projections is positioned at a first sidewall
3 of the recessed portion;
4 a second projection of the four projections is positioned at an opposing
5 sidewall of the recessed portion; and
6 a third projection and a fourth projection are spaced apart from one
7 another within the recessed portion and from the first projection and the
8 second projection.

1 16. The tool according to claim 15, wherein:
2 a distance measured between inner sidewalls of the third projection
3 and the fourth projection represent a minimum weld bead dimension and a
4 distance measured between outer sidewalls of the third projection and the
5 fourth projection represent a maximum weld bead variation dimension for the
6 minimum weld bead dimension, and
7 a distance measured between sidewalls of the recessed portion
8 represent a maximum weld bead dimension and a distance measured between
9 exposed sidewalls of the first projection and the second projection represent a
10 maximum weld bead variation dimension for the maximum weld bead
11 dimension.

1 17. The tool according to claim 16, wherein:

2 a space represented between the first minimum weld bead dimension
3 and the maximum weld bead variation dimension is an allowable variation for
4 a weld bead associated with the minimum weld bead dimension; and
5 a space represented between the maximum weld bead dimension and
6 the maximum weld bead variation dimension is an allowable variation for a
7 weld bead associated with the maximum weld bead dimension.

1 18. The tool according to claim 1, wherein the at least one projection is six
2 projections, wherein the six projections form a stepped configuration at each
3 sidewall of the recess and provide weld bead variation measurements for all
4 wall thicknesses.

1 19. The tool according to claim 1, wherein the recessed portion is a
2 stepped configuration forming at least two stepped portions.

1 20. The tool according to claim 1, wherein the recessed portion is a
2 stepped configuration forming a portion lower than remaining portions of the
3 recessed portion.

1 21. The tool according to claim 1, wherein the at least one fixed
2 measurement structure measures at least one of weld bead overlap, weld
3 downslope, allowable maximum and minimum weld bead variation, allowable
4 material thickness variation, convexity and concavity.

1 22. A method for measuring a maximum and minimum allowable material
2 thickness using a tool having a recessed portion with a stepped configuration,
3 the method comprising the steps of:

4 placing a first portion of the recessed portion over a thickness of the
5 material;

6 navigating the first portion over portions of the material;

7 determining whether the first portion slips over the thickness of the
8 material and, if so, then the material thickness is within allowable thickness
9 variation; and
10 determining whether the material enters a second, narrower portion of
11 the recessed portion and, if not, then the material thickness is within allowable
12 thickness variation.

1 23. A method of measuring bead overlap, comprising the steps of:

1 measuring a bead width at a certain location by placing a structure
2 with edges near the bead;
3 rotating the structure approximately 90 degrees;
4 placing the structure lengthwise across the bead;
5 aligning one of the edges of the structure with an outside edge of a
6 weld bead at about the certain location; and
7 count an amount of bead overlaps between the edges of the structure.

1 24. The method of claim 23, comprising the step of centering the structure
2 over the bead when placing the structure lengthwise. .